

**AMENDMENTS TO THE CLAIMS**

1 -5. (Cancelled)

6. (Original) A method of transmitting data from a plurality of mobile stations to a base station, the method comprising:

dividing the mobile stations into a first and a second data rate group;

selecting a first mobile station for transmission, the first mobile station being the first one in a data queue and in the first data rate group;

calculating first cross correlations between array response vectors of the first mobile station and the rest of the mobile stations in the first data rate group;

comparing the first cross correlations to a predetermined threshold;

selecting a second mobile station unless all the first cross correlations are greater than or equal to the predetermined threshold and all second cross correlations between array response vectors of the first mobile station and mobile stations in the second data rate group are greater than or equal to the predetermined threshold; and

transmitting data from said selected mobile stations simultaneously.

7. (Original) The method of Claim 6, wherein the second mobile station has an associated one of the first cross correlations that is the lowest of the first cross correlations if at least one of the first cross correlations is less than the predetermined threshold.

8. (Original) The method of Claim 6, wherein the second mobile station has an associated one of the second cross correlations that is the lowest of the second cross correlations if there are no first cross correlations less than the predetermined threshold and if at least one of the second cross correlations is less than the predetermined threshold.

9. (Original) The method of Claim 6, further comprising determining whether a third mobile station is selected, wherein the determining comprises:

calculating third cross correlations between array response vectors of the second mobile station and mobile stations in the second data rate group;

calculating fourth cross correlations between array response vectors of the first mobile station and mobile stations in the second data rate group;

determining if any mobile station in the second data rate group has associated therewith cross correlations with respect to the first mobile station and the second mobile station below the predetermined threshold;

summing the cross correlations with respect to the first mobile station and the second mobile station with any mobile station of the second data rate group determined to be below the predetermined threshold;

selecting as the third mobile station a mobile station having a smallest sum of cross correlations with respect to the first mobile station and the second mobile station.

10. (Original) The method of Claim 6, further comprising determining whether a third mobile station is selected, wherein the determining comprises:

calculating third cross correlations between array response vectors of the second mobile station and mobile stations in the first data rate group that have cross correlations less than the predetermined threshold; and

selecting the third mobile station if at least one of the first and at least one of the third cross correlations are less than the predetermined threshold, the third mobile station having an associated one of the third cross correlations that is the lowest of the third cross correlations.

11. (Original) The method of Claim 6, further comprising determining whether a third mobile station is selected, wherein the determining comprises:

calculating third cross correlations between array response vectors of the second mobile station and mobile stations in the second data rate group that have cross correlations less than the predetermined threshold; and

selecting the third mobile station if at least one of the second and at least one of the third cross correlations are less than the predetermined threshold, the third mobile station having an associated one of the third cross correlations that is the lowest of the third cross correlations.

12. (Original) A method of transmitting data from a plurality of mobile stations to a base station, the method comprising:

selecting a first mobile station, the first mobile station being first in a data queue;

calculating cross correlations of array response vectors of the first mobile station and array response vectors of other selected mobile stations;

selecting one or more of the mobile stations based on mobile stations having cross correlations less than a predetermined threshold; and

transmitting simultaneously the selected mobile stations during a next data packet duration.

13. (Original) The method of Claim 12, wherein the transmission is the maximum instantaneous data rate of the selected mobile stations.

14-40. (Cancelled)